AuPS News

June 2016

Michael Roberts Education Award Winner 2015
Dr Julia Choate, Monash University

What is your background in physiology education and research?

I completed a science degree (with majors in Botany and Zoology) at the University of Melbourne. I loved studying comparative animal physiology and had intended to enrol in 'Human' Physiology, but was enticed to remain in Zoology (and Botany) by the field trips (who wouldn't enjoy a week at Wilsons Promontory?). After a brief stint undertaking wet field research investigating stress in the platypus, I moved into laboratory-based research for honours and then a PhD (in Zoology) with Professor David Hirst, using electrophysiology and transmission electron microscopy to investigate the autonomic innervation of sino-atrial node pacemaker cells. This involved one year of meticulous serial sectioning and reconstructions of autonomic neuro-effector junctions with the late Dr Megan Klemm, who was an outstanding electron microscopist. David was a fabulous supervisor; he encouraged me to present my research at AuPS and International meetings, introduced me to key researchers in autonomic neuroscience and was adamant that my research had to be published in the 'top' physiology journals.

After my PhD I spent a challenging year recording from synaptically connected pyramidal neurones in the rat visual cortex with Professor Julian Jack at the

Oxford University Laboratory of Physiology, only managing to record and fill/stain four pairs of connected neurones. I subsequently returned to my favoured research area of cardiac neuro-effector junctions, with a British Heart Foundation Postdoctoral position at Oxford with Professor David Paterson, and spent five years researching the effects of exercise and the roles of NO in the autonomic control of cardiac function. During this period I taught one-on-one tutorials with students undertaking the Oxford PPP (Psychology, Philosophy and Physiology) degree-program. These students were extremely focussed and I recall reading plenty of research papers so I could feel one step ahead of them. I also gave my first lectures, on my favourite topic of sino-atrial node pacemaking. Lectures were quite different then – the 'hard' slides were prepared well in advance and had to be loaded in the correct order and orientation (my most challenging experience of these lectures!). At Oxford I also taught (medical) physiology practicals, including cannulated frog hearts (with surface action potential recordings) and anaesthetised rabbits (with infused solutions and blood gas analysis – perfect for the medical students). Having limited exposure to physiology within my zoology degree, this teaching rapidly expanded my physiology knowledge, and also prompted a subsequent move into academia so that I could combine my passions for teaching and research.

The lure of home and family brought me back to Melbourne, where I took up a lectureship at Monash Physiology in 2000. At this time, my research used nNOS knockout mice to examine the role of NO in the autonomic control of cardiac function (recording the cardiovascular effects of autonomic activation in isolated atria with intact autonomic innervation – a delicate dissection). Between 2004 and 2008 I took time off to have two children and became a part-time academic, leading to a decrease in my research productivity. However, I had always thoroughly enjoyed educating students, especially helping them to understand physiological concepts during hands-on practical classes, so in 2011 I became an education focussed academic. Monash introduced these positions for academics who were excellent educators and who had engaged with the scholarship of teaching and learning. At Monash we are fortunate to be supported as educators and I have just been awarded a Fellowship from the Monash Education Academy that will assist me with my educational research. My research examines how we can encourage active student learning. I have created interactive guided-inquiry lectures that enhance student participation, understanding and skills development in large cohort lectures (I presented this at AuPS in 2014). These lectures use Process Oriented Guided Inquiry Learning, a learning cycle of exploration, concept invention and application to guide students in constructing new knowledge, and also develop higher-order skills such as critical thinking, problem solving, and communication. I am also 'flipping' practical classes with pre-practical experimental on-line simulations, enabling in-class research skills development within inquiry-based practicals, a process that increases the engagement of students and teachers.

What are some of the current challenges for physiology educators?

The uncapping of university places has led to huge increases in student enrolments; at Monash we have ~500 science and ~500 biomedical science Physiology students at 2nd year, with most

progressing onto 3rd year physiology subjects. These increased enrolments, together with the generation of online courses and resources, challenges academics to create a mix of innovative online and on-campus teaching and assessment for large and diverse cohorts. For physiology educators, this also leads to increasing pressure to justify the expense, time, staffing and resources required in order to run multiple repeats of practical laboratory classes. Whilst student enrolments are increasing, the employment rates for Australian graduates with a Bachelor degree in life sciences are decreasing; this is partially attributed to about 50% of these graduates continuing into further full-time university study, including graduate medicine (Graduate Careers Australia, 2014). In contrast to the popularity of graduate medicine, fewer Australian biomedical and science graduates are choosing a research career. These shifting career aspirations change the nature of the student cohorts in biomedical sciences and means that academics need to ensure that students understand the relevance and value of a scientific education. For example, with students heavily focussed on content (and grades), they are often oblivious to the research and employability skills they are developing as they progress through their course. Educators need to clearly articulate these skills to students; this may involve developing teaching activities that mimic real world learning, providing students with opportunities to experience issues such team management and the pressures associated with working with real clients, as well as developing their employability skills in a real world scenario. My current research involves creating and evaluating, together with Monash careers staff, an in-curriculum undergraduate professional development program that aims to enhance biomedical employability skills development and careers awareness (assessed via electronic portfolios). This program was introduced into the Bachelor of Biomedical Sciences course last year and initial feedback indicates that students really appreciate academic involvement with their careers development, but they would like more hands-on experience of careers, so I am exploring possibilities for work-integrated learning programs.

I was excited and honoured to be presented with the Michael Roberts Award at the AuPS meeting in Hobart last year. I appreciate the growing support for physiology educators from the society, which provides a national forum for Physiology educators, with an education workshop and symposium (including expert international speakers) at the annual meeting. I am fortunate to be an education focussed physiology academic, a position that allows me to combine my passions for educating undergraduates and for higher education research and I am looking forward to presenting my research at the AuPS meeting in Adelaide this year.

Dr Julia Choate is a Senior Lecturer (Education focussed), director of undergraduate physiology education and deputy program convenor of the Bachelor of Biomedical Science Course (Monash University).

Dr Choate was awarded The Michael Roberts Excellence in Physiology Education prize at the AuPS 2015 Scientific Meeting. Dr Choate will present the Roberts Award Lecture at the 2016 AuPS Adelaide meeting. Nominations for the 2016 Roberts award will be opening soon, and will close in October. Please keep an eye on the AuPS website for more details.

Mid-year update from AuPS National Secretary

The successful running of the AuPS annual meeting in Hobart capped off a busy 2015. There was a terrific turnout, the science was outstanding, MONA was interesting and the accompanying river cruise and dinner were fabulous, and the organisation by Steve Rattigan and his team was seamless. So, congratulations to the local organising committee for hosting a great meeting.

There has been significant movement within the AuPS Council. Gary Housley and Kimberley Mellor were elected to Council in the most recent elections, and Deanne Skelly was elected to the position of National Secretary-Elect. Severine Lamon was appointed to Council as the Membership Officer, replacing Deanne Skelly. Deanne has made a tremendous contribution in refining the role of the membership officer, which has no doubt contributed to maintaining solid membership subscriptions. Council also farewelled Robert Lee-Young as a general councillor, and Brad Launikonis, who has made a major contribution to the Society in his role as Treasurer and as the local organiser of the 2014 annual meeting in Brisbane.

In other news, Paul Gregorevic and Glenn Wadley attended the 'Science Meets Parliament' event as the AuPS representative. Like previous attendees, they found the meeting to be an interesting and valuable exercise and challenged their views on how to best promote efficient interactions between science and policy makers. Gary Housley and David Ryugo participated in a Joint Symposium within the 93rd meeting of the Physiological Society of Japan (PSJ) in Sapporo. By all reports it was a good meeting, with excellent networking with the PSJ Council. We endeavour to support the exchange between Australian and Japanese physiologists in the coming years.

Looking forward, the 2016 annual scientific meeting will be hosted by the University of South Australia. The meeting will be run in conjunction with the Australian Society for Biophysics and will be held from Sunday 4th December to Wednesday 7th December. Janna Morrison and her local organizing committee have put together a terrific program that includes over a dozen International speakers and provides representation across most of the major interest groups of the Society. The program is being finalized but I can say that the conference dinner, which is included in the cost of registration, will be held at the newly redeveloped Adelaide Oval. In keeping with the format of previous years, we will once again take the opportunity to present a number of our annual prizes during the dinner. These include presentation of the Michael Roberts Teaching Award, AK McIntyre Award, the Post-Doctoral and PhD publication prizes. The call for applicants for these prizes will be made in August and September. Further details of the meeting are on the website and also detailed in this Newsletter.

We are forward planning for the 2017 AuPS meeting, which will be held in Melbourne. The local organising committee headed by Natalie Trevaskis will host the meeting at Monash University (in Parkville, top end of the city). The call for symposia for Melbourne 2016 will be made in August this year, with submissions likely to be closed around the end of October.

Good luck with the grant rebuttals and exam marking in the coming weeks and I look forward to seeing as many of you as possible in Adelaide.

Matthew Watt
AuPS National Secretary

Student Member Profile – Cara Timpani
Victoria University

What is your research background – how did you get interested in Physiology?
While completing the second year of my Bachelor of Biomedical Science at Victoria University in 2009, I was offered the opportunity to undertake a Summer Research Scholarship under the supervision of Associate Professor Alan Hayes and Dr. Emma Rybalka. This short yet intense introduction into the world of research was the catalyst that sparked my passion for research and led me to completing Honours and enrolling into my PhD. Throughout this time, my research has focused on characterising the metabolic abnormalities associated with Duchenne Muscular Dystrophy and investigating potential metabolic therapies to address them.

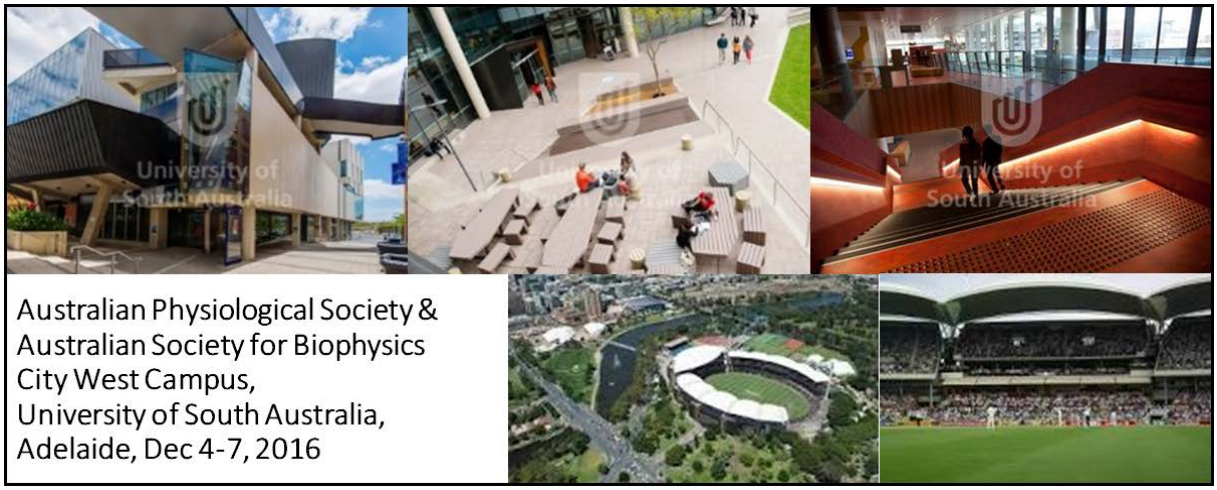
What was your award winning research?
A component of my doctoral thesis has investigated adenylosuccinic acid treatment of the *mdx* mouse, a model of Duchenne Muscular Dystrophy, to assess its potential as a metabolic therapeutic candidate. Adenylosuccinic acid is a purine nucleotide that increases the energy status of cells by stimulating mitochondria and preventing nucleotide loss from the muscle into the bloodstream during metabolic stress. Following 8 weeks of adenylosuccinic acid therapy, we observed a dramatic attenuation of skeletal muscle histopathology. We are currently investigating the mechanisms behind these effects. The implications of these findings may lead to the use of adenylosuccinic acid as a new therapy for Duchenne Muscular Dystrophy in the future.

What do you do to relax?
As my thesis is due in August, I don't have much time to relax however when I do find a few spare minutes I love to cook. Coming from an Italian background, food has always been in my life and cooking is the perfect thing to help me destress. Some (actually lots!) freshly baked cookies or brownies have helped me get through some stressful times in my PhD!

What is the research direction you would like to take in the next 3-5 years?
I have a great desire to move my research from benchtop to bedside so that the work I am doing can help Duchenne Muscular Dystrophy patients. As there is no cure for the disease, and current treatment options are associated with side effects, there is a definite need to expand available treatment options and our group believes that metabolic therapy may be the key.

Cara was awarded the AuPS prize for best poster presentation at the 2015 Scientific Meeting in Hobart. The prize was proudly sponsored by SDR.

AuPS/ASB Adelaide 2016



Provisional Research Symposia

- A placenta for life
- Alternative approaches to the use of animals in physiology and biophysics
- Cardiomyocyte mechano- and myofilament dysfunction in heart failure progression
- Developmental origins of health and disease: metabolism and exercise
- Enteric neural functional circuits of intestinal motility
- Imaging cardiovascular disease and promoting repair
- Latest advances in fluorescence and applications to physiological problems
- Mechanisms of pumps, channels and transporters
- Membrane active peptides and proteins
- New paradigms in myocardial metabolism and pathogenesis
- Recent advances in the understanding adipose tissue development and function
- Skeletal muscle physiology in health, disease and ageing
- The many pathways of gut control of metabolism
- Thinking small: Seeing biological processes with nanotechnology and photonics
- Transporters and channels as drug targets in cancer

Physiology Education Symposium

- Transforming the classroom and helping others to adopt teaching innovations

Michael Roberts Excellence in Physiology Education Award Lecture:

- **Dr Julia Choate, Monash University**

Conference Dinner: The Adelaide Oval

Local Contact: Prof Janna Morrison janna.morrison@unisa.edu.au

Meeting website now open

Science meets Parliament

1st and 2nd March, 2016. Canberra

By Glenn Wadley (Deakin University)

For the past 16 years, Science and Technology Australia has been running SmP to help parliamentarians understand how important the work of scientists is to Australia's economic, social and political future. The program is attended by over 200 young and not so young Australian scientists from diverse disciplines. The two day program is designed to help scientists better communicate their science to parliamentarians, policymakers and the media. Paul Gregorevic and I were fortunate to be chosen as representatives of AuPS.

Day one of the program was devoted to preparing delegates for the parliamentarians they were assigned to meet the following day. We were fortunate to receive the opening address from Prof Brian Schmidt AC, Nobel Laureate and Vice-Chancellor of ANU. Not just a genius physicist but politically very smart. His advice was when meeting politicians to take small steps and begin establishing relationships, as it's unlikely we would change someone's mind immediately, if at all. He believed our job over the two days was to sell what our work was doing for Australia today – not ask for money! This was a theme reiterated throughout the day. Rather than focus on funding (or lack thereof), talk about the constraints of your work. His philosophy when speaking to politicians is that as a scientist it's his job to focus on the technical aspects so they can focus on the policy problems to do the right thing for the country. Perhaps the most useful piece of practical advice was during question time. Prof Schmidt was asked by a food scientist specialising in genetically modified (GM) crops how he would have any hope of relating to his assigned politician who was pro-organic farming and very anti-GM. Prof Schmidt's advice was rather than starting with your differences to start with what you share – which is concerns for food security and take it from there. It's unlikely you'll ever persuade someone to change their mind on the anti-GM food issue but there are plenty of things to talk about.

Prof Brian Schmidt (AC) opening address

Meet the media

Photos courtesy of Mark Graham & Science meets Parliament

A mid-morning "meet the media" roundtable was fascinating. Paul Bongiorno (Network Ten) and Alison Carabine (ABC Radio National) provided many insights into a politician's life and their hectic schedule. They also shared their thoughts on how science stories do and don't make the news and how external factors and timing can often make a difference as to what makes the cut and what doesn't. Perhaps the most telling aspect of the discussion was the very deep level of respect they shared for the politicians and what they do. Interactive workshops in the afternoon then focussed on perfecting our "science in 60 seconds" pitch using the technique of "and…, but…., therefore…" Having to distil your message down into something so short and clear was quite a challenge.

One of the most informative events in the program was attending the Gala dinner at Parliament House. The informal networking and access to politicians was an eye opener. Literally bumping into the Hon Warren Truss (ex Deputy PM) at pre dinner drinks and the opportunity to discuss the problem of type 2 diabetes with him was very rewarding. During dinner, every delegate was seated at a table with a parliamentarian. The “buzz” in the room was around the recently announced National Innovation and Science Agenda (always referred to as NISA).Following dinner and speeches, there was ample opportunity to mingle. The prize for last politician to leave went to the Hon Bill Shorten who made a point of staying to speak to anyone who was interested. He surprised a group of PhD student delegates by requesting an impromptu meeting with them the following day.

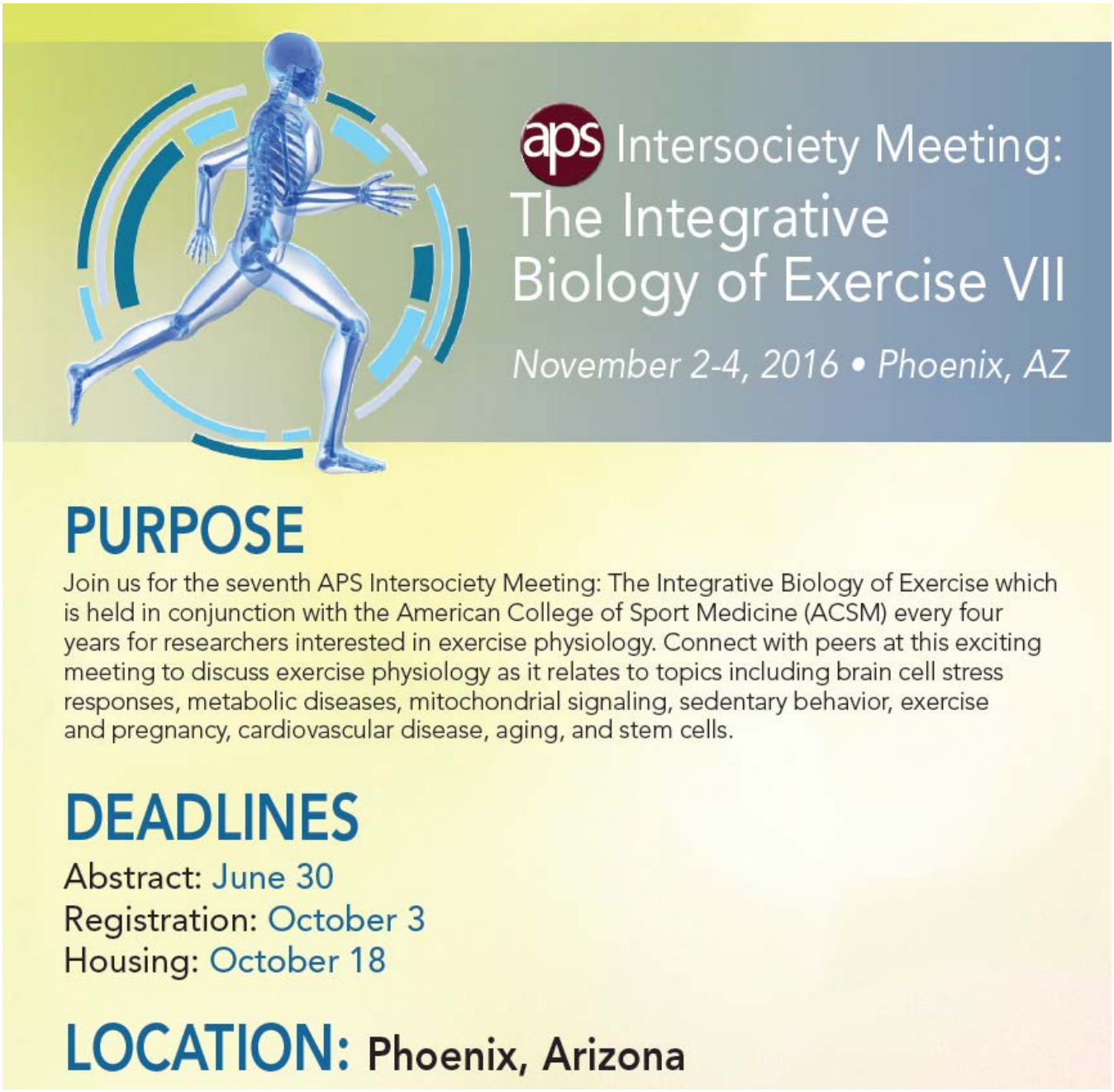
Gala dinner – Great Hall Parliament house **Photo courtesy of Mark Graham & Science meets Parliament**

Day 2 was devoted to meeting your allocated parliamentarian. This was typically in a group of 3-4 scientists. The allocation was done by STA and based on an alignment of your research interests and the areas of interest nominated by each politician. Most of us had followed SmP’s advice and done some homework on our pollie, finding out their electorate, their interests and how our work might be relevant to the people they represent. One point to take from the meetings was that a politician’s day is so fluid that the allocated meeting times were often changed or cut short due to external events. Our own personal experience with our parliamentarians were that not only had they done some homework on us but the time they did have was devoted to learning about us, our work and in particular our community and professional engagement.

For those who had finished meeting their parliamentarian it was off to the National Press Club (to our surprise it is an actual club – not just a room on the TV) for lunch and to listen to the nationally televised address by the new Chief Scientist for Australia Dr Alan Finkel (AO).

Top: The morning cue waiting to get past security. Photo courtesy of G. Wadley
Bottom: Delegates meeting with Ms Sharon Claydon, MP for Newcastle. Photo courtesy of Ms Claydon's office

To learn more about SmP, or the work of STA please see the STA website. There are links to many of the speeches and presentations we listened to. Both of us found this to be one of the most rewarding professional experiences we have undertaken and we would like to thank AuPS for the opportunity to represent our society.



http://www.the-aps.org/exercise

38th World Congress of the International Union of Physiological Sciences, Brazil, 2017

Dear Student Members,

We are excited to connect with you through social media!! A new student and early career researchers member page has been developed on Facebook! The page is titled: **Australian Physiological Society - Students and Early Career Researchers**. The aim of this page is to provide another means to inform our student members and ECR's about upcoming events, awards/scholarships that are available and also important registration and submission dates. We will also aim to post new information about jobs and postdoc positions that are circulated to members, as well as highlight our student member of the month with some information about their area of research and accomplishments!

Privacy: It is important to note that, as Facebook is a social media page, your profile will be accessible to the page administrators, Tahnee Kennedy and Nicole Vargas (your current student representatives). The page will, in no way, be used for determining awards/scholarships, council positions and the like. Also, note that while your profile will be open to page administrators, other individuals who like the page will not have access to your page, unless your privacy settings allow it.

At this time, we would love to ask you to 'like' our Facebook page if you are a student member or early career researcher!! We are very excited to open these lines of communication and hope that they will keep everyone in the loop!

Thanks for your support and we'll see you on Facebook!!

Kind Regards,
Tahnee Kennedy and Nicole Vargas
AuPS student representatives

ADInstruments design and build high-performance data acquisition systems, trusted for a wide range of life science research and teaching applications. PowerLab hardware has provided reliable and sensitive data acquisition for an entire generation of scientists and educators, and combines with LabChart analysis software and a huge range of signal transducers to offer a flexible solution for almost all types of acquisition and analysis. Typical applications include human and animal physiology, pharmacology, neurophysiology, biology, zoology, biochemistry, and biomedical engineering.

AuPS Supporters

This issue of AuPS News was compiled by Glenn Wadley and with many thanks to the generous contributors.

The next issue of AuPS News will be distributed to members in September 2016.
All contributions for AuPS News should be sent to: newsletter@aups.org.au before the end of August.